Evaluation of Dietary Intake of Various Vitamins in Menopausal Women with Hot Flashes

Sıcak Basması Olan Menopozal Kadınlarda Diyetle Alınan Çeşitli Vitaminlerin Değerlendirilmesi

Dietary Vitamin Intake and Menopausal Hot Flashes

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Özet

Amaç: Menopozal sıcak basmaları kadınların birçoğunu etkilemektedir. Hormon replasman tedavisi sıcak basmalarının şiddetini azaltan en etkili yöntemdir. Ancak günümüzde daha fazla kadın, hormon tedavisinin bir takım yan etkileri nedeniyle, vitamin hapları ve bitkisel ürünler gibi alternatif tedaviler aramaktadır. Daha önce bu amaçla çeşitli vitaminler, mineraller ve eser elementler çalışılmıştır. Bu çalışmada amacımız, sıcak basmaları olan kadınlarda diyetle alınan çeşitli vitaminlerin düzeyini belirlemek ve şikâyeti olmayan kadınlarla karşılaştırmaktır. Gereç ve Yöntem: Rutin takip için hastanemiz menopoz kliniğine başvuran ardışık 107 kadın bu çalışmaya dâhil edildi. Tüm katılımcılar menopoza özgü belirtilerin varlığı açısından Satia tarafından geliştirilen 92 maddelik antioksidan besin anketi ile sorgulandı. Her bir kadın için kaydedilen ana parametreler; yaş, obstetrik özellikler, vücut kitle indeksi, sigara içme durumu, eğitim düzeyi, menopoz (cerrahi veya doğal) tipi, menopoz süresi, menopoz semptomları, sıcak basmalarının sayısı ve süresiydi. Diyetle alınan suda çözünen vitaminler; B grubu ve C vitamini ve yağda çözünen vitaminler; vitamin A, D, E, K anketin bilgisayarlı analizine göre hesaplandı. Bulgular: Hastalar sıcak basmaları varlığı açısından iki gruba ayrıldı, sıcak basması olanlar çalışma grubunu (n: 75) ve sıcak basması olmayanlar kontrol grubunu oluşturdu (n: 32). Hastaların yaş ortalaması çalışma grubunda istatistiksel anlamlı olarak düşüktü (p <0,001). Ortalama menopoz süresi yine bu grupta daha düşüktü (p <0,001). Obstetrik özellikleri, vücut kitle indeksi, sigara içme durumu, eğitim düzeyi ve menopoz tipi açısından gruplar arasında istatistiksel olarak anlamlı fark yoktu (p>0,05). Gece terlemeleri ve uyku bozuklukları sıcak basmaları olan kadınlarda daha sıktı. Değerlendirilen diyetle alınan vitaminlerin ortalama seviyeleri açısından gruplar arasında istatistiksel olarak anlamlı fark yoktu. Tartışma: Çalışılan vitaminlerin ortalama seviyeleri sıcak basmaları olan kadınlarda düşük olmasına rağmen, fark istatistiksel olarak anlamlı değildi. Şuan için, sıcak basmalarından şikâyetçi postmenopozal kadınlarda vitamin desteği tavsiye edilmemelidir. Sıcak basmalarında vitamin desteğinin rolünü belirlemek için ileri araştırmalara gereksinim vardır.

Anahtar Kelimeler

Antioksidan Besin Anketi; Sıcak Basmaları; Menopoz; Vitaminler

Abstract

Aim: Menopausal hot flashes affect the majority of women. Hormone replacement therapy to reduce the severity of hot flashes is the most effective method. Today, however, due to a number of side effects of hormone therapy more women are seeking alternative treatments such as vitamin pills and herbal products. Previously, various vitamins, minerals and trace elements were studied for this purpose. In this study, our aim was to determine the level of dietary intake of various vitamins in women with hot flashes and to compare them with women who had no complaints. Material and Method: One hundred and seven consecutive women who attended the menopause clinic of our hospital for routine follow up were included in this study. All of the participants were asked about the occurrence of specific menopausal symptoms and completed 92-itm antioxidant nutrient questionnaire developed by Satia. The main parameters recorded for each woman were; age, obstetrical characteristics, body mass index, smoking status, educational level, type of menopause (surgical or natural), duration of menopause, menopausal symptoms, and number and duration of hot flashes. According to the computerized analysis of questionnaire, dietary intake of water-soluble vitamins; B complex and vitamin C, and fat-soluble vitamins; vitamin, A D, E, K were calculated. Results: Patients were divided into two groups with regard to presence of hot flashes, those with hot flashes constituted the study groups (n:75), and others without hot flashes constituted the control group (n:32). The mean age of patients was statistically significantly lower in the study group (p<0,001). The mean duration of menopause was also lower in this group (p<0,001). There were no statistically significant differences between groups in terms of obstetrical characteristics, body mass index, smoking status, educational level, type of menopause (p>0,05). Night sweats and sleep disorders were more common in women with hot flashes. There were no statistically significant differences between the groups regarding the mean levels of dietary intake of evaluated vitamins. Discussion: Although the mean levels of all studied vitamins were lower in women with hot flashes, the differences were statistically insignificant. Supplementation with vitamins should not be recommended in postmenopausal women suffering hot flashes currently. Further investigations are required to determine the role of vitamin supplements for hot flashes.

Keywords

Antioxidant Nutrient Questionnaire; Hot Flashes; Menopause; Vitamins

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Introduction

Menopause is defined as the irreversible cessation of ovarian function and termination of a woman's reproductive life. Menopause is associated with negative symptoms such as hot flashes, night sweats; uterine bleeding problems, mood changes, sleeping disorders, vulvovaginal atrophy and sexual dysfunction [1]. Women mostly experience this condition between 45 years to 55 years in all over the world. The mean age at menopause is reported to be 51 years in Turkey [2]. Many pharmacologic and non- pharmacologic treatment modalities have been defined to prevent the negative symptoms of menopause such as; acupuncture yoga, hypnosis, herbal therapies, multivitamin intakes, hormone replacement therapies and many other drugs like clonidine, gabapentine, pregabaline and selective serotonin reuptake inhibitors [3].

As a result of human metabolism reactive oxygen species (ROS) are produced and increasing levels of ROS causes cell damage. Human body decreases ROS by antioxidant defense systems in order to prevent the cell damage [4]. Many previous studies have shown that, higher dietary antioxidant intake reduces the risk of diseases such as; cancer, cardiovascular disease, cataracts, immune system disorders, diabetes and neurodegenerative diseases [5-7]. Herber-Gast et al [8] reported that a diet rich from fruit or Mediterranean-style decreased the risk of vasomotor symptoms in middle aged women.

The aim of this study was to determine the level of dietary intake of various vitamins; some of them have antioxidant properties, in women with hot flashes and to compare them with women who had no complaints.

Material and Method

This prospective study was conducted at the Zekai Tahir Burak Women's Health Education and Research Hospital, between mid-April and mid-May 2013. This is a tertiary referral hospital in the capital city of Turkey, Ankara. This is a government supported hospital and most of the health services are free of charge, therefore, the socioeconomic status of the patients is mostly low-medium. A total of 107 consecutive patients admitted to the menopause clinic were included into the study. Seventy five of the patients who had hot flashes constituted the study group and the other 32 of them who did not complain of hot flashes constituted the control group. This study was approved by the institutional ethics committee (Decision-Date No: 6-09/23/2013), and it was performed according to the standards of Helsinki declaration. Written informed consent was also obtained from all participants. Natural menopause was defined as menopausal after 12 continuous months of amenorrhea, without any gynecological surgery or other procedures that would have put an end to menstruation. Surgical menopause was defined as removal of both ovaries before natural menopause. Detailed information was collected on menopausal symptoms by asking; have you ever experienced any of the following symptoms after menopause, such as hot flashes, sexual dysfunction, night sweats, sleep disorders or vaginal dryness? If hot flashes exist, its frequency and duration were questioned. Other menopausal symptoms were assessed as yes or no. In addition to the routine pelvic examination, all patients were evaluated with blood test, ultrasound, vaginal smear, endometrial sampling when necessary, mammography, and bone densitometry. It was confirmed that all women were clinically and hormonally in the menopausal period. Women with a history of drug use for menopausal hot flashes were excluded from the study.

Dietary vitamin levels were measured according to a 92-item antioxidant nutrient questionnaire developed by Satia et al [9]. Clinical information obtained from the patients included age, gravidity, parity, number of alive children, abortion and dilatation –curettage procedure, height-weight (body mass index [BMI; calculated as kg/m2], co-morbidities, smoking status, educational level, type of menopause, menopausal symptoms (hot flashes, night sweats, sleep disorders, sexual dysfunction, vaginal dryness), and duration of menopause. All respondents accompanied by two specialist doctors completed the questionnaire.

Antioxidant Nutrient Questionnaire

Dietary vitamin levels were measured according to the new 92-item antioxidant nutrient questionnaire developed by Satia et al [9], modeled after the semi-quantitative FFQ (Food Frequency Questionnaire) and designed to capture usual dietary and supplemental intakes of various vitamins. The postmenopausal women were asked how often they ate particular foods over the course of the past month and also to mark the amount of each food they ate as 'small', 'medium' or 'large'. Nutrient analyses were performed with the use of the nutrient database program (BeBiS software program) designed to evaluate Turkish and commercial foods [10].

Statistical analysis

The mean difference and standard deviations were calculated for continuous variables. Subject characteristics and demographics were analyzed descriptively. The normal distribution of the variables was analyzed by the Kolmogorov-Smirnov and Shapiro-Wilk tests. The Chi-square test, Fisher's exact test, and the Student's t-test were used to evaluate associations between the categorical and continuous variables. Continuous variables with non-normal distribution were analyzed using the Mann–Whitney U test. A P value <0.05 was considered to indicate significance.

Results

The demographic and clinical characteristics of the cases are shown in Table 1. We evaluated 75 postmenopausal women with hot flashes (study group) and 32 post menopausal women without hot flashes as control group. The occurrence rate of hot flushes in postmenopausal women was found to be 70.1% in this cohort. The mean age of patients in the study group was 53.6±5.6 years and in the control group was 60.2±5.3 years ($p<0.001$). Mean menopause duration was 7.0±5.1 years and 14.1±11.8 years in the study and control groups, respectively ($p<0.001$). There were no statistically significant differences in terms of obstetrical characteristics, BMI, smoking status, educational level and type of menopause between the groups. 6 cases had hypothyroidism, 7 cases had hypertension, 3 cases had diabetes, 2 patients had depression, and one patient had asthma in the control group. In the study group, hypothyroid-

Table 1. The demographic and clinical characteristics of the cases

	Study group n:75	Control group n:32	P value
Age (years)*	53.6±5.6	60.2±5.3	<0.001
Gravidity+	4(0-12)	5(0-10)	0.374
Parity+	3(0-8)	3(0-8)	0.870
No. of Alive Children+	3(0-7)	3(0-7)	0.683
Abort ion+	1(0-7)	1(0-5)	0.689
D&C+	0(0-6)	0(0-6)	0.407
Height (cm) *	158.0±5.3	157.0±5.6	0.383
Weight (kg) *	74.9±12.7	75.5±10.9	0.839
BMI (kg/m2) *	30.0±4.8	30.6±4.3	0.535
Smoker -/+#	62 / 13	28 / 4	0.942
Educational level #			
Elementary	67	24	
High school	6	5	0.137
University	2	3	
Type of menopause#			
Natural	66	27	0.829
Surgical	9	5	
Menopause duration (years) *	7.0±5.1	14.1±11.8	<0.001
Duration of hot flashes (minutes) *	4.9±4.8(1-30)		
No. of hot flashes*	4.5±4.0(1-30)		

BMI: body mass index; D&C: dilatation and curettage. Data are presented as mean±standard deviation, number#, median (minimum-maximum)*. P<0.05 is considered statistically significant.

ism, hypertension, diabetes, and depression were in 4, 20, 5, and one patient, respectively. In addition, one patient had been operated due to breast cancer and she was in remission for two years in this group. There was no significant difference between the groups in terms of co-morbidities. According to the antioxidant nutrient questionnaire, all dietary micronutrients levels were found to be lower in the postmenopausal women with hot flashes, however the differences were not statistically significant (p>0.05). The levels of these vitamins are depicted in Table 2. Night sweats and sleep disorders were significantly more common in the study group (Table 3).

Table 2. Comparison of dietary vitamin intakes from the antioxidant nutrient questionnaire among patients

	Study group	Control group	P value
Vitamin A (µg)	1106±3604.3	1624.1±3604.3	0.193
Beta-carotene (mg)	0.9±0.9	1.1±0.9	0.192
Vitamin D (µg)	2.8±2.9	2.9±3.1	0.788
Vitamin E (µg)	78.3±107.1	91.2±109.6	0.538
Vitamin K (µg)	93.4±115.0	100.1±142.4	0.540
Thiamine(B1) (µg)	0.4±0.2	0.5±0.2	0.796
Riboflavine(B2) (µg)	2.3±2.3	2.5±2.2	0.618
Niacin(B3) (µg)	6.1±4.0	6.4±4.0	0.757
Pantothenate(B5) (µg)	1.3±1.2	1.4±1.7	0.695
Pyridoxine(B6) (µg)	9.0±11.3	9.5±10.8	0.560
Biotin (µg)	50.4±43.3	57.5±49.7	0.518
Cobalamine(B12) (µg)	45.5±61.6	55.0±69.3	0.460
Folic acid (µg)	137.7±87.7	150.9±93.9	0.312
Vitamin C ((µg))	363.4±387.1	373.1±367.1	0.752

Data are presented as mean±standard deviation.

Table 3. Distribution of the menopausal symptoms.

	Study group	Control group	P value
Vaginal dryness -/+	37 / 38	20/ 12	0.211
Night sweats -/+	46 / 29	28 / 4	<0.001
Sexual dysfunction -/+	23/ 52	23/ 9	0.297
Sleep disorders -/+	41/ 34	27/ 5	0.003

Data are presented as number. P<0.05 is considered statistically significant.

Discussion

According to this study, hot flashes are common symptoms among the postmenopausal women. Hot flashes, night sweats, and sleep disorders are also more frequent in patients with short menopause duration. It seems that dietary intake of various vitamins, also some of them having antioxidant activity, has not an effect on hot flashes.

Hot flashes are the most common vasomotor symptom during climacterium affecting as many as 75% of menopausal women [11]. They are described as spontaneous sensations of warmth affecting the face, neck and upper chest, and are often associated with increased peripheral blood flow, skin temperature, heart rate, sweating and anxiety. Typically they end in 1–5 min. and their frequency ranges from 1 to 50 attacks in a day. Early and surgically menopausal women may complain of severe hot flashes than women with natural menopause. Approximately 80% of the 20 million women in the menopausal age (45-54) is experiencing hot flashes in the United States. This incidence increases to 95-100% in surgically menopausal women [12]. Although hot flushes typically last for 0.5 to 5.0 years after natural menopause, they may persist for as long as 15 years in a small percentage of postmenopausal women [13]. The overall incidence of menopausal hot flashes in our study population was found to be 70.1% which is compatible with the literature. We also found that hot flashes experienced by women with shorter duration of menopause, and other psychological disorders, such as night sweats and sleep disorders were more common in this group.

Hot flashes may lead to significant physical and emotional distress requiring treatment for some women [14]. Although the exact pathophysiology is unknown, estrogen withdrawal has been thought to cause central thermoregulatory center dysfunction, which eventually will lead to hot flashes [15]. This process is primarily regulated by norepinephrine which lowers the thermoregulatory set point and triggers the heat loss mechanisms [16]. In addition, serotonin is thought to induce hot flashes [17]. Hormone replacement therapy reliably reduces the severity of hot flashes and still remains the single most effective treatment. However many women suffering severe vasomotor symptoms are seeking alternatives such as vitamins, and other over-the-counter products instead of hormonal therapy [18]. Because studies have shown that hormone therapy increases the risk of stroke, deep venous thrombosis and breast cancer. Today, many institutions recommend against the use of menopausal hormone therapy for the primary and secondary prevention of chronic conditions [19]. As a clinical approach, the hormone replacement therapy is not routinely used in our patients unless it is necessary. And women with a history of drug use such as hormone and multivitamin containing pills were ex-

cluded from this study.

Many pharmacologic and non- pharmacologic treatment modalities have been defined to reduce the menopausal hot flashes such as; acupuncture herbal therapies, multivitamin intakes and many other drugs like clonidine, gabapentine, pregabaline, methyldopa, veralipride, and selective serotonin reuptake inhibitors. Meanwhile, the importance of hot flashes also should be mentioned in women with breast cancer. In the literature, the treatment of hot flashes with hormone therapy in breast cancer patients is still controversial. Menopausal period overlaps with the peak period of breast cancer. Therefore, these patients feel more severe hot flashes and also the use of tamoxifen and other chemotherapeutics increases the frequency of occurrence of hot flashes. There was a woman who was operated from breast cancer in our study. The frequency of hot flashes in this woman was more and longer than the others due to tamoxifen use.

All vitamins, minerals and trace elements play an important role in maintaining health and wellbeing among menopausal women. Adequate dietary intake is essential and supplementation should be considered in women with documented deficiency of the exact micronutrient. Based on a review of the literature, supplementation with vitamin C, D, K and calcium can also be recommended for proper maintenance of bone health. Gaweesh et al [20] evaluated the effect of folic acid supplementation on the occurrence of hot flashes by measuring plasma levels of a norepinephrine metabolite. And they concluded that folic acid supplementation may cause subjective improvement of hot flushes by lowering the increased central noradrenergic activity. In another study evaluating the effect of vitamin E on hot flashes, authors found that the severity of hot flashes significantly reduced after the treatment with vitamin E [21]. These supplements studied for vasomotor symptoms have a lack of large clinical support. In contrast to these studies, we found no difference between vitamin levels in women with and without hot flashes. However, our findings do not certainly show that post-menopausal women should not use these vitamins.

Diet has been believed to play a role in the development of chronic diseases and literature has reported a connection between the diet and the diseases. A similar relationship had been shown between the menopausal symptoms and dietary habits. Phytoestrogens are the most commonly tested drugs in hot flashes. The most extensively studied of these is 'black cohosh' (Cimicifuga Racemosa). Today, black cohosh extracts are being studied as effective treatments for symptoms associated with menopause. It is fact that Asian women have less menopausal hot flashes than western women. Asian women consume more soy which contains a phytoestrogen called isoflavone. Isoflavones reduce 50-60% of mild to moderate hot flashes [22]. In this situation, it seems that one of the most important factors is dietary habits in menopausal symptoms. Even, a study indicated that eating itself suppressed the frequency of hot flashes [12]. Cell damage caused by ROS is considered to result in degenerative diseases of aging such as cancer, cardiovascular disease, cataracts, immune system decline, and brain dysfunction [23]. Antioxidants are the elements that are known to control the formation of the ROS and prevent cell damage [24]. Vitamin C, vitamin E, vitamin A and beta carotene are the best known dietary antioxidants [23]. Therefore, in current study we evaluated the amounts of these nutrients in the study and control groups. There are several limitations of our study. One of them is that nutrients evaluated in the questionnaire shows seasonal variations. In addition, this survey may not be applicable to every community due to the different dietary habits. Nevertheless, to our knowledge this is the first study evaluating this association on this issue. Also its prospective nature, interviewing by face to face, and performing by the same physicians are the strengths of this study.

Conclusion

Although the mean levels of all studied vitamins were lower in women with hot flashes, there were no statistically significant differences between two groups. We think that supplementation with multivitamins should not be recommended in postmenopausal women suffering hot flashes currently. Further investigations should be performed to determine the role of vitamin supplements for hot flashes.

Competing interests

The authors declare that they have no competing interests.

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